IN THE CLAIMS

1. (Currently amended) A multilayer ceramic coating for providing thermal barrier protection to a ~~substrate~~ gas turbine outer air seal that opposes a blade tip or knife edge, said multilayer ceramic coating comprising an inner ceramic layer coating the ~~substrate~~ gas turbine outer air seal, the inner ceramic layer having a plurality of macrocracks distributed throughout the inner ceramic layer, wherein the macrocracks comprise vertical segmentation macrocracks that extend at least one half the thickness of the inner ceramic layer and there are from about 7.5 to 75 vertical macrocracks per linear centimeter of coating width, and an outer ceramic abradable layer coating the inner ceramic layer, the outer ceramic abradable layer being substantially free of vertical macrocracks, and wherein said multilayer ceramic coating has a high speed tip-to-seal wear ratio of 0.1 or less, a thickness of at least about 0.2 mm, and cyclic thermal shock resistance up to a temperature of at least about 2500°F.

2. (Canceled)

3. (Previously presented) The multilayer ceramic coating of claim 1 wherein the cracks of the inner ceramic layer are vertical and horizontal macrocracks.

4. (Previously presented) The multilayer ceramic coating of claim 1 wherein the inner ceramic layer includes at least a first cracked layer and a second cracked layer.

5. (Previously presented) The multilayer ceramic coating of claim 1 wherein the inner ceramic layer has a porosity that increases from an inner surface of the inner ceramic layer to an outer surface of the inner ceramic layer.

6. (Previously presented) The multilayer ceramic coating of claim 1 wherein the outer ceramic layer has a porosity that increases from an inner surface of the outer ceramic layer to an outer surface of the outer ceramic layer.

7. (Canceled)

8. (Canceled)

9. (Currently amended) The multilayer ceramic coating of claim 3 wherein the total horizontal macrocracks extend from about 15 to 100% of the coating width as measured across a plane normal to an interface of the ~~substrate~~ gas turbine outer air seal with the multilayer coating.

10. (Currently amended) The multilayer ceramic coating of claim 9 wherein the total horizontal macrocracks extend from about 20 to 60% of the coating width as measured across a plane normal to an interface of the ~~substrate~~ gas turbine outer air seal with the multilayer coating.

11. (Currently amended) A multilayer zirconia-based coating for providing thermal barrier protection to a ~~substrate~~ gas turbine outer air seal that opposes a blade tip or knife edge, said multilayer zirconia-based coating comprising an inner zirconia-based layer coating the ~~substrate~~ gas turbine outer air seal, the inner zirconia-based layer having a plurality of vertical macrocracks distributed throughout the inner zirconia-based layer, wherein the vertical macrocracks extend at least one half the thickness of the inner zirconia-based layer and there are from about 7.5 to 75 vertical macrocracks per linear centimeter of coating width, and an outer zirconia-based abradable layer coating the inner zirconia-based layer, the outer zirconia-based abradable layer being substantially free of vertical macrocracks, and wherein said

multilayer zirconia-based coating has a high speed tip-to-seal wear ratio of 0.1 or less, a thickness of at least about 0.2 mm, and cyclic thermal shock resistance up to a temperature of at least about 2500°F.

12. (Original) The multilayer zirconia-based coating of claim 11 wherein the inner zirconia-based layer includes horizontal macrocracks.

13. (Previously presented) The multilayer zirconia-based coating of claim 11 wherein the inner zirconia-based layer includes at least a first cracked layer and a second cracked layer.

14. (Previously presented) The multilayer zirconia-based coating of claim 11 wherein the inner zirconia-based layer has a porosity that increases from an inner surface of the inner zirconia-based layer to an outer surface of the inner zirconia-based layer.

15. (Previously presented) The multilayer zirconia-based coating of claim 11 wherein the outer zirconia-based layer has a porosity that increases from an inner surface of the outer zirconia-based layer to an outer surface of the outer zirconia-based layer.

16. (Canceled)

17. (Currently amended) The multilayer zirconia-based coating of claim 12 wherein the horizontal macrocracks are from about 0.1 to 2.5 mm in length and the total horizontal macrocracks extend from about 15 to 100% of the coating width as measured across a plane normal to an interface of the ~~substrate~~ gas turbine outer air seal with the multilayer zirconia-based coating.

18. (Currently amended) The multilayer zirconia-based coating of claim 17 wherein the total horizontal macrocracks extend from about 20 to 60% of the coating width as measured across a plane normal to an interface of the ~~substrate~~ gas turbine outer air seal with the multilayer zirconia-based coating.

19. (Original) The multilayer zirconia-based coating of claim 11 wherein the outer zirconia-based layer has a density of about 45 to 90% of theoretical.

20. (Original) The multilayer zirconia-based coating of claim 11 wherein the outer zirconia-based layer has a density of about 50 to 86% of theoretical.

21. (Original) The multilayer zirconia-based coating of claim 11 wherein the outer zirconia-based layer has a density of about 50 to 70% of theoretical.

22. (Original) The multilayer zirconia-based coating of claim 11 wherein the inner and outer zirconia-based layers have a total thickness of about 0.2 mm to about 10 mm.

23. (Canceled)

24. (Original) The multilayer zirconia-based coating of claim 11 wherein the multilayer zirconia-based coating contains a stabilizing element for partially or fully stabilizing the at least one crystallographic phase selected from the group of tetragonal and cubic.

25. (Currently amended) The multilayer zirconia-based coating of claim 11 including a bondcoat between the ~~substrate~~ gas turbine outer air seal and the inner zirconia-based layer.

26. (Original) The multilayer zirconia-based coating of claim 25 wherein the bondcoat contains at least one inner sublayer and an outer sublayer, and the outer sublayer has a surface roughness of at least about 3.8 μm as measured before the application of the inner zirconia-based layer to the outer sublayer.

27. (Original) The multilayer zirconia-based coating of claim 25 wherein the bondcoat is sealed with a heat treatment.

28. (Currently amended) A ~~substrate~~ gas turbine outer air seal having a multilayer ceramic coating for providing thermal barrier protection to at least a portion of the ~~substrate~~ gas turbine outer air seal, the multilayer ceramic coating comprising an inner ceramic layer coating the ~~substrate~~ gas turbine outer air seal, the inner ceramic layer having a plurality of cracks distributed throughout the inner ceramic layer, wherein the cracks comprise vertical segmentation macrocracks that extend at least one half the thickness of the inner ceramic layer and there are from about 7.5 to 75 vertical macrocracks per linear centimeter of coating width, and an outer ceramic abradable layer coating the inner ceramic layer, the outer ceramic abradable layer being substantially free of vertical macrocracks, and wherein said gas turbine outer air seal opposes a blade tip or knife edge and said multilayer ceramic coating has a high speed tip-to-seal wear ratio of 0.1 or less, a thickness of at least about 0.2 mm, and cyclic thermal shock resistance up to a temperature of at least about 2500°F.

29. (Canceled)

30. (Canceled)

31. (Canceled)

32. (Canceled)

33. (Currently amended) A ~~substrate~~ gas turbine outer air seal having a multilayer zirconia-based coating for providing thermal barrier protection to at least a portion of the ~~substrate~~ gas turbine outer air seal, the multilayer zirconia-based coating comprising an inner stabilized zirconia layer coating the ~~substrate~~ gas turbine outer air seal, the inner stabilized zirconia layer having a plurality of vertical macrocracks distributed throughout the inner stabilized zirconia layer, wherein the vertical macrocracks extend at least one half the thickness of the inner stabilized zirconia layer and there are from about 7.5 to 75 vertical macrocracks per linear centimeter of coating width, and an outer stabilized zirconia abradable layer coating the inner stabilized zirconia layer, the outer stabilized zirconia abradable layer being substantially free of vertical macrocracks, and wherein said gas turbine outer air seal opposes a blade tip or knife edge and said multilayer zirconia-based coating has a high speed tip-to-seal wear ratio of 0.1 or less, a thickness of at least about 0.2 mm, and cyclic thermal shock resistance up to a temperature of at least about 2500°F.

34. (Canceled)

35. (Canceled)

36. (Canceled)

37. (Canceled)

38. (Currently amended) The ~~substrate~~ gas turbine outer air seal of claim 33 wherein the inner stabilized zirconia layer contains a first layer having a first thermal conductivity and a first thickness and a second layer having a second thermal conductivity and a second thickness for combining two different thermal conductivities and for forming a desired total thermal conductivity and a desired total thickness.